BRITTONIA

A JOURNAL OF SYSTEMATIC BOTANY

CONTENTS

of

Volume 29

Supplement to BRITTONIA, Vol. 29, No. 4, October–December, 1977

CONTENTS OF VOLUME 29

NUMBER 1 [BRITTONIA for January–March 1977 (29: 1–136) was issued on 25 April 1977]

Taxonomic and morphological relationships of the Psilotaceae: a symposium
Introduction
1 **Richard A. White**

The systematic position of *Psilotum* and *Tmesipteris*
3 **David W. Bierhorst**

Morphologic and taxonomic relationships of the Psilotaceae relative to evolutionary lines in early land vascular plants
14 **Patricia G. Gensel**

Morphological status of the shoot systems of the Psilotaceae
30 **Donald R. Kaplan**

Systematic implications of the Psilotaceae
54 **W. H. Wagner, Jr.**

Discussion
64

A revision of the genus *Phyllonoma* (Grossulariaceae)
69 **Scott A. Mori and Jacquelyn A. Kallunki**

A new species of *Eupatorium* (Compositae) endemic to Grand Bahama Island
85 **Susan Plettman**

Morphological studies of the Nymphaeaceae. VII. The floral biology of *Nuphar lutea* subsp. *macrophylla*
88 **Edward L. Schneider and Lesa A. Moore**

Chemotaxonomy of some Paleozoic vascular plants. Part II: Chemical characterization of major plant groups
100 **K. J. Niklas and P. G. Gensel**

A new species of *Pinguicula* from Mexico (Lentibulariaceae)
112 **S. J. Casper and Katsuhiko Kondo**

The variation and evolution of selected species of *Solanum* section *Basarthrum* (Solanaceae). II.
116 **Gregory J. Anderson**

Chromosome observations on some eastern North American *Eleocharis* (Cyperaceae)
129 **Alfred E. Schuyler**

Instructions to contributors
134

Notes
68, 87, 99, 115

NUMBER 2 [BRITTONIA for April–June 1977 (29: 137–240) was issued on 15 June 1977]

The Compositae revisited
137 **Arthur Cronquist**

Two new species for the Flora of Panama
154 **Ghillean T. Prance**

Chromosome numbers, polyploidy, and hybridization in *Castilleja* (Scrophulariaceae) of the Great Basin and Rocky Mountains
159 **Lawrence R. Heckard and Tsan-Iang Chuang**

Notes on Neotropical Vaccinieae (Ericaceae). IV. A review of the genus *Oreanthes*
173 **James L. Luteyn**

Notes on Neotropical Vaccinieae (Ericaceae). V. Five new species from South America
177 **James L. Luteyn**

The correct author citation of *Bunchosia* (Malpighiaceae) and three new Central American species
183 **Frederick H. Dobson III**

Review of the genus *Perama* (Rubiaceae)
191 **Julian A. Steyermark and Joseph H. Kirkbride, Jr.**

The taxonomy of *Xylorhiza* (Asteraceae—Astereae)
199 **Thomas J. Watson, Jr.**

Notes on the Asteraceae of the Southeastern United States
217 **Arthur Cronquist**

Studies on fungi cultivated by ants
226 **Annette Hervey, Clark T. Rogerson and Ina Leong**

A new species of *Eleocharis* (Cyperaceae) from the West Indies
237 **Tetsuo Koyama**

News and Notes
153, 198, 239

NUMBER 3 [BRITTONIA for July–September 1977 (29: 241–352) was issued on 23 August 1977]

Theoretical evolutionary rates in plant groups and the fossil record
241 **Karl J. Niklas**

New genera and species of Ericaceae (Vaccinieae) from Costa Rica and Panama
255 **James L. Luteyn and Robert L. Wilbur**

Monographic studies in *Cassia* (Leguminosae: Caesalpinioideae). IV. Supplementary notes on section *Apoucouita* Bentham
277 **Howard S. Irwin and Rupert C. Barneby**

A study of morphological variability in *Chenopodium incanum* (Chenopodiaceae) and the recognition of two new varieties
291 **Daniel J. Crawford**

Chromosome races of *Gaillardia pulchella* (Asteraceae)
297 **Warren Stoutamire**

The occurrence of nitro-toxins in North American *Astragalus* (Fabaceae)
310 **M. Coburn Williams and Rupert C. Barneby**

The occurrence of nitro-toxins in Old World and South American *Astragalus* (Fabaceae)
327 **M. Coburn Williams and Rupert C. Barneby**

Two early Mississippian seeds from the Price Formation of southwestern Virginia
332 **Patricia G. Gensel and Judith E. Skog**

News and Notes
331, 352

NUMBER 4 [BRITTONIA for October–December 1977 (29: 353–448) was issued on 8 December 1977]

Tetraplodon paradoxus and *T. pallidus* (Musci: Splachnaceae) in northern North America
353 **William Campbell Steere**

Atrichum cylindricum (Polytrichaceae), an overlooked moss in the southeastern United States
368 **Gary L. Smith**

Dragma Hippomanicum III: Novitates Californicae
376 **Rupert C. Barneby**

Technical note: Ultraviolet reflectance-absorbance photography; an easy, inexpensive research tool
382 **Robert J. Hill**

Chromosome counts for Mexican ferns
391 **Alan R. Smith and John T. Mickel**

Chromosome numbers of Panamanian Lecythidaceae and their use in subfamilial classification
399 **Robert R. Kowal, Scott A. Mori, and Jacquelyn A. Kallunki**

Arceuthobium (Viscaceae) in Mexico and Guatemala: Additions and range extensions
411 **Frank G. Hawksworth and Delbert Wiens**

The *Flora North America Reports*—A bibliography and index
419 **Becky R. Rohr, Jane I. Lawyer, Larry E. Morse, and Stanwyn G. Shetler**

Notes and book reviews
367, 375, 381, 418, 432, 433

Volume Index
434

Statement of Ownership
448

INDEX TO VOLUME 29

New names and combinations and their pages of publication are printed in **boldface**, fig. = figure.

Abdulmajidia 400
Abies 415; *religiosa* 415
Acacia 46, 67, 211; *alata* 46
Acer lanceolatum fig. 388
Aceraceae: *Acer* 388
Acorus 40, 47; *calamus* fig. 39, 40
Acromyrmex (*Moellerius*): *aspersus* 228, 236; *heyeri* 228, 236; *landolti* 228–229, subsp. *balzani* 228, 236; *lobicornis* 228, 232, 236; *octospinosus* 228–229, 232; *striatus* 228
Actinostachys 5–7, 10–12, 24, 66; *melanesica* 4; *pennula* 7
Adiantaceae 59; *Adiantum* 41, 391–392; *Cheilanthes* 392; *Eriosorus* 394; *Hemionitis* 391, 394; *Pellaea* 391, 394; *Pteris* 397; *Vittaria* 398
Adiantum 392; *concinnum* 391–392; *cuneatum* 392; *diaphanum* 392; *formosum* fig. 41; *poiretii* 392
Agaricus 235
Agavaceae: *Agave* 207; *Yucca* 209
Agave 207
Agropyron 214
Algae 105, 107–108
Alismataceae: *Sagittaria* 97
Allantoma 400
Allium 212
Amauropelta 397
Ambrosia 143, 207, 211, 308
Ambrosiinae 147–148
American Fern Society 1
American Rhododendron Society 418
American Society of Plant Taxonomists 1
Ammodia 218
Anachoropteris 15
ANDERSON, GREGORY J., The variation and evolution of selected species of *Solanum* section *Basarthrum* (Solanaceae). II. 116–128
Anemia phyllitidis 392
Anemiaceae 5
Anemioideae 59
Aneurophytales 101
Aneurophyton 15
Ankyropteris 15, 26; *grayi* 25
Anthemideae 148–151
Ants 226–236, 383; leaf-cutting 226–236
Apiaceae 146
Apis 96; *mellifera* 92–93, 96
Aplopappus 201; *tortifolius* 201, 210
Apterostigma: *auriculatum* 228, 234; *mayri* 228
Aquifoliaceae: *Ilex* 373
Araceae: *Acorus* 39–40, 47
Arachniodes denticulata 391–392
Araliaceae 69, 146
Arceuthobium 411–418; key to taxa formerly included under *A. globosum* 411–413; *abietis-religiosae* 411, 414–416; **aureum** 412, **414**, subsp. *aureum* 411–412, 414–415, subsp. **petersonii** 411–412, 414–**415**; *divaricatum* 411, 417; *gillii* subsp. *nigrum* 411, 416; *globosum* 411–414, subsp. *globosum* 411–413, subsp. **grandicaule** 411–414, **413**; *guatemalense* 411, 417; *hondurense* 411; *juniperi-procerae* 414; *rubrum* 411, 417–418; *vaginatum* subsp. *cryptopodum* 416, subsp. *durangense* 416–417, subsp. *vaginatum* 416
Arceuthobium (Viscaceae) in Mexico and Guatemala: Additions and range extensions, by Frank G. Hawksworth & Delbert Wiens 411–418
Archaeoperisaccus 17
Archaeopteridales 101
Archaeopteris 15, 22, 100, 104–106; *macilenta* 101
Archaeosperma 348; *arnoldii* 332, 340
Archibaccharis 141
Arctoteae 149, 151
Arctotideae 137, 148–151
Arctotis 151
Arecaceae 33; *Colpothrinax* 263
Aristida 209
Arnica 148
Aroids 67
Artemisia 141, 143; *tridentata* 141, 161
Arthrophyta 15
Arthrophyte 108
Asclepiadaceae 426; *Sarcostemma* 426
Aspleniaceae 55–56; *Amauropelta* 397; *Arachniodes* 391–392; *Asplenium* 32, 391–392, 394–395; *Ctenitis* 392–393; *Cyclosorus* 397–398; *Cystopteris* 393; *Didymochlaena* 393; *Diplazium* 391, 393; *Dryopteris* 33–34, 391, 393; *Elaphoglossum* 393, 396; *Goniopteris* 398; *Phanerophlebia* 391, 394, 396; *Polybotrya* 396; *Polystichum* 396–397; *Tectaria* 397; *Thelypteris* 397–398
Asplenium 392; *monanthes* 391–392; *repandulum* 391–392, 394, fig. 395; *rhizophyllum* 32; *sessilifolium* 392; *unilaterale* 392
Aster 199, 201–202, 215, 217–219; section *Megalastrum* 199; section *Orthomeris* 199; *abatus* 210; *cognatus* 204; *coloradoensis* 215; *frutescens* 203; *georgianus* 217–218; *glabriusculus* 214, var. *parryi* 214, var. *typicus* 214; *gooddingii* 211; *kingii* 215; *lanceolatus* 211; *mohavensis* 210; *orcuttii* 206; *parryi* 214; *patens* 217, var. **georgianus 218**, var. *gracilis* 217, var. *patens* 217, var. *patentissimus* 217, var. *phlogifolius* 217; *scopulorum* 211; *standleyi* 204; *tortifolius* 199, 210, var. *funereus* 211; *venustus* 199, 212; *wrightii* 199, 208; *xylorrhiza* 214
Asteraceae 85–87, 137–153, 199–225, 297–309; ancestry and relationships 142–147; historical background 137–139; intrafamilial classification 147–149; primitive characters and evolutionary trends 139–142; southeastern

United States 217–225; subfamily Asteroideae 149–150; subfamily Cichorioideae 149–150; tribe Anthemideae 148–151; tribe Arctoteae 149, 151; tribe Arctotideae 137, 148–151; tribe Astereae 141, 148–149; tribe Calenduleae 149; tribe Cardueae 149; tribe Cichorieae 148–149; tribe Cynareae 148–151; tribe Eupatorieae 149–150; tribe Heleneae 137–138, 147–148, 150; tribe Helianthеae 137–140, 143, 147–151; tribe Inuleae 140, 149; tribe Lactuceae 137, 148–151; tribe Liabeae 137, 148; tribe Mutisieae 140, 149–151; tribe Senecioneae 137, 148–149; tribe Vernonieae 138–140, 148–151; subtribe Ambrosiinae 147–148; subtribe Coreopsidinae 148–149; subtribe Liabinae 148; subtribe Madiinae 148; subtribe Tagetinae 137, 147; subtribe Zinniinae 148; *Ambrosia* 143, 207, 211, 308; *Ammodia* 218; *Aplopappus* 201, 210; *Archibaccharis* 141; *Arctotis* 151; *Arnica* 148; *Artemisia* 141, 143, 161; *Aster* 199, 201–204, 206, 208, 210–212, 214–215, 217–219; *Baccharis* 141; *Baeria* 149; *Baileya* 211; *Berkheya* 150; *Bidens* 389; *Centaurea* 151; *Chrysanthemum* fig. 386; *Chrysopsis* 217–220; *Conyza* 141, 202; *Coreopsis* fig. 386; *Didelta* 151; *Doronicum* 148; *Eremothamnus* 148; *Erigeron* 141, 202, 219; *Espeletia* 141, 152; *Eupatorium* 57, 85–87, 138, 217, 220; *Fitchia* 149, 151; *Gaillardia* 217, 220–221, 297–309; *Gazania* 151; *Haplopappus* 141, 200–201, 209, 219; *Helenium* 220; *Helianthus* 140, 214, 217, 221–223; *Heterotheca* 217–219; *Lepidospartum* 148; *Lygodesmia* 214; *Machaeranthera* 199–204, 206–208, 210–212, 214–215; *Melampodium* 308; *Mikania* 57; *Nabalus* 223; *Olearia* 141; *Pityopsis* 218; *Prenanthes* 217, 223; *Psathyrotes* 148; *Psilactis* 201, 219; *Rudbeckia* 387–388; *Senecio* 138–139, 141, 212; *Silphium* 217, 223; *Solidago* 140, 217, 223–224; *Stephanomeria* 207, 211; *Stokesia* 151; *Townsendia* 208; *Tragopogon* 214; *Ursinia* 148, 150–151; *Viguiera* 141, 143; *Wyethia* 141; *Xylorhiza* 199–216

Asterales 145

Asteranthos 400–401, 403–404

Astereae 141, 148–149, 199–216, 219

Asteridae 145

Asteroideae 149–150

Asteroxylon 15, 19, 144

Astragalus 211–212, 214, 310–331, 376–381; sect. *Alopecias* 328, 330; sect. *Ammodendron* 328, 330; sect. *Argophylli* 318–320; sect. *Astragalus* 312; sect. *Atrati* 316; sect. *Bicristati* 318; sect. *Brachycarpus* 327–330; sect. *Buceras* 328, 330; sect. *Camptopodes* 314, 326; sect. *Chaetodontes* 323, 378; sect. *Collini* 314, 325–326; sect. *Conjuncti* 318; sect. *Cusickiani* 315, 378; sect. *Dasyphyllium* 328, 330; sect. *Desparati* 320; sect. *Diphaci* 323; sect. *Diphysi* 321; sect. *Drabellae* 314; sect. *Drummondiani* 317; sect. *Ervoidei* 315; sect. *Euodmus* 325, 329; sect. *Flexuosi* 376; sect. *Genistoidei* 313, 324–325; sect. *Gigantei* 320; sect. *Greggiani* 322, 326; sect. *Gynophoraria* 315–316; sect. *Hemiphaca* 312, 327–330; sect. *Hemiphragmium* 312, 327–330; sect. *Hesperonix* 318; sect. *Hypoglottoidei* 318; sect. *Hypoleuci* 323; sect. *Inflati* 321, 380; sect. *Inyoenses* 316; sect. *Jaegeriani* 317; sect. *Jejuni* 316; sect. *Layneani* 320; sect. *Leptocarpi* 321–322, 324–325; sect. *Lonchocarpi* 314; sect. *Malaci* 317, 325–326; sect. *Megalocystis* 328, 330; sect. *Malanocercis* 327–330; sect. *Melilotopsis* 327–330; sect. *Michauxiani* 317, 324–325; sect. *Micranthi* 322; sect. *Minerales* 312, 325; sect. *Miselli* 316; sect. *Mollissimi* 320; sect. *Monoenses* 321; sect. *Myobroma* 328, 330; sect. *Neglecti* 318; sect. *Neonix* 316, 378; sect. *Nudi* 317–318; sect. *Orobella* 329; sect. *Oroboidei* 312, 325, 327–330; sect. *Oxyglottis* 328, 330; sect. *Pachypodes* 317; sect. *Pectinati* 316; sect. *Podosclerocarpi* 315; sect. *Polares* 315; sect. *Proselius* 328, 330; sect. *Pruniformes* 317; sect. *Pterocarpi* 321, 324–325; sect. *Quinqueflori* 316, 326; sect. *Reventi-arrecti* 317; sect. *Sarcocarpi* 320–321; sect. *Scalares* 313; sect. *Scaposi* 322; sect. *Scytocarpi* 313, 325–326, 378; sect. *Sewerzowia* 327–330; sect. *Solitarii* 314; sect. *Strigulosi* 312–313, 378; sect. *Succumbentes* 322; sect. *Tennesseenses* 321; sect. *Tweedyani* 315, 326; sect. *Uliginosi* 318, 325–330; sect. *Villosi* 321; sect. *Xiphidium* 328, 330; series *Falcati* 329; series *Nutantes* 329; subsect. **Shevockiani** 376, **378**; *aboriginum* 312; *accidens* var. *accidens* 317, var. *hendersonii* 317; *adanus* 317; *aequalis* 314; *agnicidus* 316; *agrestis* 318; *albens* 322; *alpinus* 325; *altus* 312; *alvordensis* 314; *amphioxys* var. *amphioxys* 320, var. *vespertinus* 320; *andersonii* 323; *aquilonius* 321; *arequipensis* 328; *argophyllus* var. *argophyllus* 318, var. *martini* 318, var. *panguicensis* 318; *arizonicus* 322; *arnottianus* 328; *arrectus* 317; *arthuri* 316; *atratus* var. *atratus* 316; *atropubescens* 317; *australis* 328; *bicristatus* 318; *bidentatus* 328; *bodini* 315; *bolanderi* 318; *bourgovii* 315; *breweri* 322; *bryantii* 321; *bubaloceras* 328; *californicus* 315; *callithrix* 318; *calycosus* var. *calycosus* 322, var. *mancus* 322, var. *scaposus* 322; *camptopus* 314; *canadensis* 325, 329, var. *brevidens* 318, 325, var. *canadensis* 318, var. *mortoni* 318; *caricinus* 323; *carinatus* 328; *carminis* 316; *casei* 321, 324; *castaneiformis* var. *castaneiformis* 320, var. *consobrinus* 320; *castetteri* 313; *cerussatus* 321; *chamaeleuce* 320; *chamaemeniscus* 317; *cibarius* 317, 325; *clevelandi* 322; *coahuilae* 322; *cobrensis* var. *cobrensis* 313, var. *maguirei* 313; *coccineus* 319; *collinus* 314, var. *collinus* 314, var. *laurentii* 314; *coltoni* var. *coltoni* 314, var. *moabensis* 314; *compositus* 328; *congdoni* 316; *conjunctus* 318; *con-*

vallarius 324, var. *convallarius* 313, var. *finitimus* 313, var. *scopulorum* 313; *coriaceus* 313, 378; *cottoni* 312; *crassicarpus* var. *berlandieri* 320, var. *cavus* 320, var. *crassicarpus* 320, var. *paysoni* 320, var. *trichocalyx* 320; *cretaceus* 328; *cronquistii* 314; *curvicarpus* 325, var. *brachycodon* 314, var. *curvicarpus* 314, var. *subglaber* 314; *cusickii* var. *cusickii* 315, var. *flexilipes* 315; *cyaneus* 319; *cymboides* 320; *densiflorus* 328; *desperatus* var. *conspectus* 320, var. *desperatus* 320; *detritalis* 314; *dictyocarpus* 328; *diphacus* 323; *distinens* 328; *diversifolius* 313, 324, 380; *douglasii* var. *douglasii* 321; *drummondii* 317; *duchesnensis* 314; *emoryanus* 324, var. *emoryanus* 322, 324, var. *terlinguensis* 322, 324; *ensiformis* 317; *episcopus* 314; *ervoides* var. *ervoides* 316, var. *maysillesii* 316; *esperanzae* 313; *eucosmus* 312; *eurekensis* 319; *falcatus* 325, 328–330; *filipes* 315; *flexuosus* var. *diehlii* 313, var. *flexuosus* 313, 325, var. *greenei* 313; *franciscquitensis* 322; *fucatus* 313; *funereus* 319; *gentryi* 321; *gibbsii* 314; *giganteus* 320; *goldmani* 322; *gracilis* 313; *greggii* 322; *gruinus* 321; *guatemalensis* var. *brevidentatus* 312; *gypsodes* 320; *hallii* var. *fallax* 313, var. *hallii* 313; *harrisonii* 314; *hartwegi* 322; *hermoneus* 328; *heterodontus* 328; *hidalgensis* var. *hidalgensis* 312, var. *protensus* 313; *himalayanus* 328; *hoodianus* 318; *howelli* 316; *hypoleucus* 323; *igniarius* 328; *inflexus* 319; *inversus* 315, 378; *inyoensis* 316; *iodopetalus* 319; *jaegerianus* 311, 317; *jejunus* 316; *johannis-howellii* 311, 316, 378; *kamtschaticus* 329; *kentrophyta* var. *coloradoensis* 315, var. *douglasii* 315, var. *elatus* 315, var. *jessiae* 315, var. *neomexicanus* 315, var. *ungulatus* 315; *kulabensis* 328; *lancearius* 314; *layneae* 320; *leibergi* 318; *lemmoni* 323; *lentiformis* 323; *lentiginosus* 380, var. *albifolius* 378, 380–381, var. *kernensis* 321, var. **piscinensis** 376, **378**–381, fig. 379, var. *sesquimetralis* 376, 378, 380–381; *leptaleus* 312; *leptocarpus* 322; *leucolobus* 319; *lindheimeri* 322; *loanus* 319; *longissimus* 312; *lyalli* 323; *lyonnetii* 312; *macronyx* 328; *macropterus* 328; *macropus* 328; *malacoides* 317; *malacus* 317; *marianus* 318; *massiliensis* 328; *melilotoides* 328; *michauxii* 317, 324–325; *micranthellus* 328; *micranthus* 312, var. *micranthus* 312, var. *seatoni* 313; *microcymbus* 311, 313; *minthorniae* var. *gracilior* 317, var. *villosus* 317; *misellus* var. *misellus* 316; *miser* var. *hylophilus* 313, 324, var. *oblongifolius* 310, 313, 324, var. *serotinus* 313, 324; *missouriensis* var. *amphibolus* 320, var. *mimetes* 320, var. *missouriensis* 320; *mohavensis* 322, var. *hemigyrus* 322, var. *mohavensis* 322; *mollissimus* var. *marcidus* 320, var. *matthewsii* 320; *molybdenus* 312; *monoensis* 321; *monumentalis* 320; *murinus* 328; *musiniensis* 319; *naturitensis* 320; *neglectus* 318; *neomexicanus* 319; *newberryi* var. *blyae* 319, var. *newberryi* 319; *nidularius* 314; *nothoxys* 321; *nudisiliquus* 319; *nutans* 321; *nuttallianus* 324; *nutzotinensis* 316; *obcordatus* 321; *odoratus* 328–329; *orcuttianus* 317; *oreganus* 318, 329; *oroboides* 328; *oxyrrhynchus* 322; *pachypus* 317, var. *pachypus* 317; *palmeri* 321; *parryi* 319; *parvus* 322; *pauperculus* 322; *paysonii* 316; *peckii* 316; *pedunculoris* 328–329; *pennellianus* 312; *pictiformis* 313; *pinonis* 314; *plattensis* 320; *polaris* 315; *politowii* 328; *polycladus* 328; *pterocarpus* 321, 324; *puniceus* 326, var. *puniceus* 313; *purshii* var. *concinnus* 319, var. *glareosus* 319, var. *lagopinus* 319, var. *lectulus* 319, var. *ophiogenes* 319, var. *pumilio* 319, var. *purshii* 319, var. *tinctus* 319; *quinqueflorus* 316; *radicans* var. *radicans* 312; *reventiformis* 318; *reventus* 317; *riparius* 317; *ripleyi* 314; *robbinsii* 310, 325, var. *alpiniformis* 312, var. *fernaldii* 325, var. *harringtonii* 312, var. *jesupii* 325, var. *minor* 312, var. *occidentalis* 312, var. *robbinsii* 325; *sanguineus* 321; *scalaris* 313; *schelichovii* 329; *schmollae* 314; *sclerocarpus* 315; *sepultipes* 378; *serenoi* var. *serenoi* 318; *sheldoni* 317; **shevockii 376**–378, fig. 377, 381; *shortianus* 319; *simplicifolius* 314; *sinaloae* 316; *sinuatus* 315; *sirinicus* 328; *solitarius* 314; *soxmaniorum* 321; *spaldingii* 323; *speirocarpus* 315; *sprucei* 328; *straturensis* 316; *strigulosus* 312; *subcinereus* 313; *subvestitus* 319; *succumbens* 322; *tennesseensis* 321; *tephrodes* 318, var. *brachylobus* 318, var. *chloridae* 319, var. *tephrodes* 318; *terminalis* 317; *tetrapterus* 321, 324; *thurberi* 321; *tidestromii* 319; *toanus* 316, 324; *tolucanus* 312; *tribuloides* 328; *tweedyi* 315; *tyghensis* 323; *umbraticus* 311, 316; *uliginosus* 328–329; *uncialis* 319; *utahensis* 319; *vaccarum* 322; *villosus* 321; *wardi* 321; *waterfallii* 319; *webberi* 318; *whitneyi* var. *confusus* 315, var. *lenophyllus* 315, var. *siskiyouensis* 315, var. *sonneanus* 315, var. *whitneyi* 315; *williamsii* 312; *xiphoides* 314; *zionis* 318; *zacatecanus* 312

Atrichum 368, 374; *altecristatum* 374; *angustatum* 368, 371, 374; **cylindricum** 368–375, **371**, figs. 369–370, fig. 372, map 373; *oerstedianum* 371, 373–374; *undulatum* 374, var. *attenuatum* 368, 371, 373, var. *minus* 371

Atrichum cylindricum (Polytrichaceae), an overlooked moss in the southeastern United States, by Gary L. Smith 368–375

Atta 226; *cephalotes* 227–229, 232; *cephalotes isthmicola* 228; *colombica tonsipes* 228, 235–236; *discigera* 235; *insularis* 235; *laevigata* 228–229, 236; *sexdens* 228, 232, 236

Attamyces 235; *bromatificus* 226, 233, 235

Azolla (Azollaceae) 32

Baccharis 141
Baeria 149
Bahama Islands: *Eupatorium* 85–87
Baileya 211
Baragwanathia 15
BARKLEY, T. M. See McGregor & Barkley 375
BARNEBY, RUPERT C.—book review of *Manual of the vascular plants of Wyoming*, by Robert D. Dorn 352
———, Dragma Hippomanicum III: Novitates Californicae 376–381
———. See Irwin & Barneby 277–290
———. See Williams & Barneby 310–326, 327–331
Barringtonia 400, 408; *acutangula* 401; *macrostachya* 408; *racemosa* 404, 408
Barringtoniaceae 403
Basidiomycetes 236
Bee(s) 89, 92, 97; euglossine 382; honey 383
Beetles 88–90, 92, 94, 96–97; cereal leaf 426; long-horned leaf 88; sap 88; sweat 88
Berkheya 150
Bertholletia 400; *excelsa* 401
Bibliography of *Flora North America Reports* 421–428
Bidens 389
BIERHORST, DAVID W., The systematic position of *Psilotum* and *Tmesipteris* 3–13
Blechnaceae: *Blechnum* 391–392
Blechnum 391; *lehmannii* 392; *occidentale* 392
Boraginaceae 146; *Coldenia* 207, 209; *Cryptantha* 212
Botanical Society of America, Paleobotanical, Pteridological, Structural, and Systematic sections 1
Botrychium 5, 11, 56; *cicutarium* 392; *virginianum* 392
Botryococcus 105–106
Botryopteridaceae 12
Botryopteris 15, 25; *forensis* fig. 25
Brassicaceae 149; *Crucifera* 149; *Nerisyrenia* 209
Brunoniaceae 146
Bryum 368–369, 371, 374; *Juniperi* 368, fig. 369, 371
Buchia 191, 193; *plantaginea* 193
Bunchosia 183–190; **brevisurcularis** 183–186, **184**, fig. 185, map 186; *cornifolia* 186, 188; *hartwegiana* 186; *lindeniana* 188, 190; **ternata** 183–184, **186**–188, map 186, fig. 187; **tutensis** 183, 186, map 186, **188**–190, fig. 189
Burseraceae 428
Butterflies 97, 383
Byrsonima 183–184
Cactaceae 60–61; *Opuntia* 57, 211, 214; *Pereskia* 57
Cactus 207
Caesalpiniaceae: Caesalpinioideae 277–290; *Cassia* 277–290
Caesalpinioideae 277–290
Calamophyton 15, 24
Calathiops bernhardti 339
Calathospermum fimbriatum 348; *scoticum* 348
Calenduleae 149
California: *Astragalus* 376–381
Calliphora vomitoria 89
Calycanthus (Calycanthaceae) 97
Calyceraceae 137, 146–147
Campanulaceae 145–146
Campanulales 145–146
Campyloneurum 391; *angustifolium* 392; *latum* 392; *tenuipes* 392; *xalapense* 392
Caprifoliaceae 144–146
Cardiopteridium 347
Cardueae 149
Carex 424, 427
Careya 400; *arborea* 401
Cariniana 400
Carpolithes 347; *tenellus* 347
CASPER, S. J. & KATSUHIKO KONDO, A new species of *Pinguicula* from Mexico (Lentibulariaceae) 112–115
Cassia 277–290; key to species of sect. *Apoucouita* 278–279; key to vars. of *C. adiantifolia* 280; key to vars. of *C. eitenorum* 286; key to vars. of *C. ensiformis* 287; key to vars. of *C. negrensis* 283; sect. *Absus* 281; sect. *Apoucouita* 277–290; series *Apoucouita* 277, 279, 281–290; series **Pteridophyllae** 278, **279**–281; subgenus *Lasiorhegma* 277, 279, 287; *acuminata* 284; *adenopoda* 288; *adiantifolia* 278–282, var. *adiantifolia* 279–280, var. *pteridophylla* 279–280; *aiarana* 278, 281–282, 284; *apoucouita* 278, 283–285, var. *floribunda* 282, var. *obtusifolia* 284, var. *plurifoliolata* 289; **aspleniifolia** 277–**280**, 281; *bahiae* 278–279, 283–284, 287–288, 290; **boyanii** 277–278, **281**–282; **compitalis** 277, 279, **289**–290; *duartei* 278, 282–283, 290; **eitenorum** 277, 279, **285**–288, 290, var. *eitenorum* 285–287, 290, var. **regana** 286–**287**, 290; *ensiformis* 279, 284–290, var. *ensiformis* 287–288, var. **maranonica** 285, 287–**288**, var. **plurifoliolata** 285, 287–**289**; *hymenaeifolia* 278, 281; *maranonica* 287–288; *multijuga* 281; *negrensis* 278, 283–284, var. **albuquerquei 283**, var. *negrensis* 283; *polystachya* 278, 281–283; *ramiflora* 283–284, 287–289, var. *amazonica* 284, 286–289, var. *ramiflora* 286–288; *rigidifolia* 281; *scleroxylon* 278–279, 285–286, 290; *solimoesensis* 284–285; *subpeltata* 290; *ulei* 281; *xinguensis* 279, 285
Castilleja 159–172, 212; chromosome numbers, polyploidy, and hybridization 159–172; group *Pallescentes* 172, group *Pilosae* 165; sect. *Lineatae* 165; *austromontana* 161; *cervina* 161, fig. 164, 165–166; *chromosa* 161, 163, 166–167; *chrysantha* 170; *covilleana* 161, fig. 164, 165; *crista-galli* 160–162, fig. 164, 165; *cusickii* 160, 162, fig. 164, 165, 168, 170; *flava* 160, 162–163, 165, 170–171; *glandulifera* 172; *gracillima* 163–165, fig. 164; *haydenii* 163–165, fig. 164; *hispida* fig. 164, 165, var. *acuta* 163, 167, var. *hispida* 163;

integra 163–165, fig. 164; *inverta* 162; *kaibabensis* 163–165, fig. 164; *lapidicola* 171; *laxa* 171; *linariifolia* 159, 162–167, fig. 164; *lineata* fig. 164, 165; *lineata* × *linariifolia* fig. 164, 165; *longispica* fig. 164, 165; *lutescens* 161, fig. 164, 165–166; *miniata* 159–168, fig. 164, 170–171; *nivea* fig. 164, 165, 167; *occidentalis* 163, 167–171, fig. 169; *oresbia* 172; *pallescens* 162, 167–170, fig. 169; *patriotica* 167–168, fig. 169; *peckiana* 163, 167; *pruinosa* 163; *puberula* 167–168, fig. 169; *pulchella* 162, 167–168, fig. 169; *purpurascens* 160, 168, fig. 169; *rhexifolia* 159–160, 162, 166–170, fig. 169; *rustica* 162, 170; *salsuginosa* 168–170, fig. 169; *scabrida* 168–170, fig. 169; *septentrionalis* 170; *sessiliflora* 168–170, fig. 169; *sulphurea* 159, 166–171, fig. 169; *tenuiflora* 171; *thompsonii* 168, fig. 169, 171; *viscidula* 168, fig. 169, 171–172; *xanthotricha* 160, 168, fig. 169, 172

Catclaw 209

Catharinea: *angustata* 368, *controversa* 371

Cavendishia: *axillaris* 181; **dodsonii** 177, **181**; *marginata* 181; *pubescens* 182; *santafeensis* 181

Celastraceae 69; *Polycardia* 69

Centaurea 151

Central America: *Bunchosia* 183–190

Cephalaria 142

Cephalomanes 57

Cephalopteris 15

Cerambycidae 89

Cercophora 400

Chaleuria 105–106, 108

Chamaesaracha 209

Chauliognathus marginatus 92, 97

Cheilanthes notholaenoides 392

Chemotaxonomy of some Paleozoic vascular plants. Part II: Chemical characterization of major plant groups, by K. J. Niklas & P. G. Gensel 100–111

Chenopodiaceae 291–296; *Chenopodium* 291–296; *Grayia* 211

Chenopodium 291–296; *fremontii* 291, 295–296, f. *farinosum* 291, 296, var. *incanum* 292; *incanum* 291–296, var. **elatum** 291, **292**–296, map 293, fig. 295, var. *incanum* 292–294, map 293, fig. 295, var. **occidentale** 291, **292**–294, map 293, fig. 295

Chlorophyllum molybdites 233

Chromosome counts for Mexican ferns, by Alan R. Smith & John T. Mickel 391–398

Chromosome numbers of Panamanian Lecythidaceae and their use in subfamilial classification, by Robert R. Kowal, Scott A. Mori & Jacquelyn A. Kallunki 399–410

Chromosome numbers, polyploidy, and hybridization in *Castilleja* (Scrophulariaceae) of the Great Basin and Rocky Mountains, by Lawrence R. Heckard & Tsan-Iang Chuang 159–172

Chromosome observations on some eastern North American *Eleocharis* (Cyperaceae), by Alfred E. Schuyler 129–133

Chromosome races of *Gaillardia pulchella* (Asteraceae), by Warren Stoutamire 297–309

Chrysanthemum leucanthemum fig. 386

Chrysobalanaceae: *Licania* 154–156

Chrysomelidae 88–89

Chrysopsis 217–220; key to vars. of *C. graminifolia* 220; sect. *Pityopsis* 219; *falcata* 219; *graminifolia* 219–220, var. *aspera* 220, var. *graminifolia* 220, var. **microcephala** **219**–220; *microcephala* 219; *oligantha* 219; *villosa* 219

Chuang, Tsan-Iang. See Heckard & Chuang 159–172

Chydenanthus 400

Chytroma 400

Cichorieae 148–149

Cichorioideae 149–150

Cladoxylales 15, 20, 22, 24

Cladoxylon scoparium 15, fig. 23, 24

Cladoxylopsida 101

Clematis × *jackmani* fig. 385

Clubmoss 59, 62

Clusia (Clusiaceae) 263

Coenopteridales 12, 20, 22, 24

Coenopteridopsida 15, 22

Coenopterids 26, 108

Coldenia 207, 209

Coleogyne 211

Coleoptera 92

Colpodexylon 15

Colpothrinax cookii 263

Combretaceae 406; *Combretum* 406

Combretodendron 400, 406; *africanum* 401

Combretum 406

Compositae: See Asteraceae

Compositae revisited, the, by Arthur Cronquist 137–153

Convolvulus (Convolvulaceae) 57

Conyza 141, 202

Cooksonia 15, 17–19, fig. 18, 100–101, 103, 105–106

Coreopsidinae 148–149

Coreopsis tinctoria fig. 386

Cornaceae 69

Correct author citation of *Bunchosia* (Malpighiaceae) and three new Central American species, by Frederick H. Dobson III 183–190

Corythophora 400

Costa Rica: Ericaceae (Vaccinieae) 255–276

Couratari 400, 404

Couroupita 400, 408; *guianensis* 399, 401–403, fig. 405, 408

Crateranthus 400

Crawford, Daniel J., A study of morphological variability in *Chenopodium incanum* (Chenopodiaceae) and the recognition of two new varieties 291–296

Crenaticaulis 15, 17, 26, 100, 103, 105–106; *verruculosus* fig. 18, 101

Creosote bush 206–207, 209, 211
CRONQUIST, ARTHUR—book review of *Atlas of the Flora of the Great Plains*, by R. L. McGregor, Coordinator, T. M. Barkley, Editor, and nine collaborators 375
———. —book review of *Rocky Mountain Flora*, ed. 5, by William A. Weber 331
———, Notes on the Asteraceae of the Southeastern United States 217–225
———, The Compositae revisited 137–153
———, ARTHUR H. HOLMGREN, NOEL H. HOLMGREN, JAMES L. REVEAL & PATRICIA K. HOLMGREN, *Intermountain Flora, volume 6. The monocotyledons*—new book reviewed 153
Crucifera 149
Cruciferae: See Brassicaceae
Cryptantha 212
Ctenitis: *equestris* 392; *hemsleyana* 392; *melanosticta* 392; *submarginalis* 393
Cupressus (Cupressaceae) 414
Cuscuta (Cuscutaceae) 57
Cyatheaceae: *Dicksonia* 33
Cyatheoideae 59
Cycadophytes 142
Cyclosorus 397–398
Cynareae 148–151
Cyperaceae 129–133, 237–239, 427; *Carex* 424, 427; *Eleocharis* 129–133, 237–239
Cyphomyrmex: *costatus* 227–229, 234–235; *rimosus* 228, 235
Cystium sesquimetrale 380
Cystoderma 232–233
Cystopteris fragilis 393
Davalliaceae: *Nephrolepis* 32, 391, 394
Delphinium 214
Dendrosenecios 141
Dennstaedtia 391; *cornuta* 393; *dissecta* 393; *distenta* 393
Dennstaedtiaceae: *Dennstaedtia* 391, 393; *Hypolepis* 391, 394; *Lindsaea* 391, 394; *Orthiopteris* 397; *Pteridium* 5–7, 42, 64; *Saccoloma* 397
Deuteromycetes 235
Diabrotica undecimpunctata 92
Dichapetalaceae 71, 73; *Dichapetalum* 154, 156–158; *Tapura* 73
Dichapetalum 154, 156–158; *bullatum* 158; **gentryi** 154, **156**–158, fig. 157; *nervatum* 156, 158; *stipulatum* 156, 158
Dicksonia 33
Dicranopteris pectinata 393
Didelta 151; *tomentosum* 151
Didonica 255; **pendula 255**–258, fig. 257, 269
Didymochlaena truncatula 393
Didymoglossum 57
Digitalis purpurea fig. 387
Dilleniaceae 403, 408
Dilleniales 408
Dilleniidae 403, 406, 408
Diplazium 391; *cristatum* 393; *franconis* 393; *inaequilaterum* 393; *lonchophyllum* 393; *striatum* 393; *tablazianum* 393; *ternatum* 393; *werckleanum* 393
Diplopteridium teilianum 348
Dipsacaceae 142, 146; *Cephalaria* 142
Dipsacales 142, 144–147
Dipterocarpaceae 403
Discussion of Psilotaceae symposium 64–68
Disterigma 255, 258–259; key to Central American species 258; *campii* 178, 180; **dumontii** 177–**178**, fig. 179, 180, 182; *humboldtii* 258; *luteynii* 258; *mayanum* 258; *panamense* 258; **trimerum** 255, **258**–259; **utleyorum** 255, 258–**259**, 260
Distribution maps: *Atrichum cylindricum* 373; *Bunchosia*, Central America 186; *Chenopodium incanum* vars. 293; *Gaillardia aristata, amblyodon, mexicana, pulchella* 307; *Phyllonoma laticuspis, ruscifolia, tenuidens, weberbaueri* 77–78, 80; *Solanum basendopogon, canense, sanctae-marthae, suaveolens* 118; *Tetraplodon mnioides, pallidus, paradoxus* 362, 365; *Xylorhiza* 205
DOBSON, FREDERICK H., III, The correct author citation of *Bunchosia* (Malpighiaceae) and three new Central American species 183–190
Dolichosperma sexangulatum 347
Donacia 89–90, 92, 94–97; *dentata* 88; *piscatrix* 88–89, fig. 91, 92–93, fig. 95, 96–97; *proxima* 89, subsp. *californica* 89; *pusilla* subsp. *pyritosa* 89; *rufa* 89; *sparganii* 89
Donaciini 97
DORN, ROBERT D., *Manual of the vascular plants of Wyoming*—new book reviewed 352
Doronicum 148
Dragma Hippomanicum III: Novitates Californicae, by Rupert C. Barneby 376–381
Drepanophycus 15
Drosophila 383
Dryopteris 391; *aristata* 33–34; *filix-mas* 393; *karwinskyana* 393; *maxonii* 393; *parallelogramma* 393
Dulongia 74; *acuminata* 69, 74, 76; *integerrima* 69, 76; *laticuspis* 69, 80
Dulongiaceae 69; *Dulongia* 69, 74, 76, 80
Elaphoglossum 393, 396
Eleocharis 129–133, 237–239; sect. *Tenuissimae* 237; *ambigens* 129–130, fig. 131, 133; *diandra* 129–130; *engelmannii* 129–130, fig. 131; *flavescens* 129–132, fig. 131; *intermedia* 129–132, fig. 131; **liogieri 237**–239, fig. 238; *nana* 237, 239; *nigrescens* 237; *obtusa* 129–130, var. *ellipsoidalis* 129–130, fig. 131, var. *obtusa* 129–130, var. *peasei* 129–130, fig. 131; *olivacea* 130, 132, f. *olivacea* 129–130, f. *reductiseta* 129–130, fig. 131; *smallii* 129–132, fig. 131; *tenuis* 129, 132, var. *pseudoptera* 129–132, fig. 131, var. *tenuis* 129–132, fig. 131, var. *verrucosa* 129–132, fig. 131; *tuberculosa* 129–132, fig. 131
ELVIN-LEWIS, MEMORY P. F. See Lewis & Elvin-Lewis 99
Empididae 89
Enallagma 92

Eohostimella 105–106
Ephedra (Ephedraceae) 211–212
Ephydridae 88
Equisetaceae 59; *Equisetum* 11, 56, 68
Equisetales 56
Equisetopsida 54, 62
Equisetum 11, 56, 68
Eremothamnus 148
Ericaceae: 173–182, 255–276; five new species from South America 177–182; *Cavendishia* 177, 181–182; **Didonica 255**–258, 269; *Disterigma* 177–180, 182, 255, 258–260; *Hornemannia* 272, 275; *Lateropora* 255, 260–261, 269; *Lysiclesia* 255, 261–263; *Macleania* 255–256, 263–265, 270; *Mycerinus* 256; *Oreanthes* 173–176; *Orthaea* 177, 181–182; *Psammisia* 256; *Semiramisia* 256; *Sphyrospermum* 268; *Symphysia* 255, 272, 275–276; *Themistoclesia* 177–178, 182, 255, 265–268; *Thibaudia* 177, 180–181; **Utleya** 255, **267**–270; *Vaccinium* 255, 269–276
Erigeron 141, 202; sect. *Phalacroloma* 219; *annuus* 219; *strigosus* 219
Eriogonum 212
Erioneuron 209
Eriosorus hirtus var. *hirtus* 394
Eristalis 89
Escalloniaceae 69, 73
Escallonieae 69
Escallonioideae 69
Escherichia coli 226, 231
Eschweilera 399–400, fig. 407; *pittieri* 399, 402, fig. 405; *sessilis* 402
Espeletia 141, 152
Eupatorieae 149–150
Eupatorium 57, 85, 138, 217, 220; *album* 220, var. *monardifolium* 220, var. **vaseyi 220**; **correlliorum 85**–87, fig. 86; *fernaldii* 220; *monardaefolium* 220; *rotundifolium* 220; *sessilifolium* 220, var. *vaseyi* 220; *vaseyi* 220; *villosum* 85–86
Euphorbiaceae 61
Euphoria kerni 92
Eupomatia (Eupomatiaceae) 97
Eurystoma 348
Evylaeus 89
Fabaceae: 310–331; *Astragalus* 211–212, 214, 310–331, 376–381; *Cystium* 380
Fagaceae: *Fagus* 373; *Quercus* 373
Fagus 373
Ferns: See Psilotaceae symposium 1–68; 391–398, 423; chromosome counts for Mexican ferns 391–398; shoot systems 32–36; coenopterid 22; curly-grass 59; dennstaedtioid 5–7; cusporangiate 68; filicalean 1, 3–6, 8–9, 11–12, 14, 24–25, 27, 55, 61; filmy 57; gleicheniaceous 30, 55, 58; leptosporangiate 30, 55, 58; lindsaeoids 7; vining 32
Filicales 1–2, 5, 11–12, 14, 30, 36, 48–49, 54–62, 65
Filicopsida 68
Fitchia 149, 151
Flacourtiaceae 73; *Phyllobotryum* 73
Flora North America Reports—A bibliography and index, the, by Becky R. Rohr, Jane I. Lawyer, Larry E. Morse & Stanwyn G. Shetler 419–432
FLÜGEL, ERIK, editor, *Fossil algae. Recent results and developments*—new book reviewed 433
Fly 88–89; caddis 89; shore 88
FNA Reports 419–432
Foetidia 400–401, 403–404
Foetidioideae 399–401, 403
Fouquieria (Fouquieriaceae) 211
Fungi 226–236; ant 226–236; Imperfecti 235
Gaillardia 217, 220–221, 297–309; ecological adaptations relating to cytotype differentiation 304–306; *aestivalis* (*aestivale*) 220, var. **flavovirens 221**; *amblyodon* 304, fig. 305, map 307; *aristata* 304–308, fig. 305, map 307; *chrysantha* 221; *comosa* 308; *gypsophila* 308; *lanceolata* 220, var. *flavovirens* 221; *lutea* 220–221; *mexicana* 304–308, fig. 305, map 307; *pinnatifida* 308; *powellii* 308; *pulchella* 297–309, fig. 305, map 307; *serotina* (*serotinum*) 220; *suavis* 308
Gazania 151
Geminitheca 348; *scotica* 340
Genomosperma 340; *kidstoni* 336, 340; *latens* 336, 340
GENSEL, PATRICIA G., Morphologic and taxonomic relationships of the Psilotaceae relative to evolutionary lines in early land vascular plants 14–29
———. See Niklas & Gensel 100–111
——— & JUDITH E. SKOG, Two early Mississippian seeds from the Price Formation of southwestern Virginia 332–351
Gentianaceae 144–145
Gentianales 145
Ginkgoaceae 56
Gleichenia 6–12, 24, 56, 64, *bifida* 394
Gleicheniaceae 5, 12, 15, 48, 58–59; *Dicranopteris* 393; *Gleichenia* 6–12, 24, 56, 64, 394
Gleichenioideae 59
Gnetopsis 333, 344–349; *anglica* 345; *augustodunensis* 345; *cristata* 345; *elliptica* 344, 348; *esnostensis* 345; *hexagona* 344–346; **hispida** 332, **340**–343, fig. 341, fig. 343, fig. 346, 346–348; *plumosa* 345; *primaeva* 345; *trigona* 344
Goniopteris 398
Gonocormus 7
Goodeniaceae 146
GOODLAND, R.—book review of *New Guinea vegetation*, edited by K. Paijmans 432
Gosslingia 15, 17, 26, 100, 103, 105–106; *breconensis* 26, 101
Grammitis: *linearis* 57; *tenella* 57
Grand Bahama Island: *Eupatorium* 85–87
Grayia 211
Greasewood 214
Great Basin: *Castilleja* 159–172
Grias 400–401, 403–404, 407; *cauliflora* 399, fig. 407; *dubia* 402; *superba* 402

Grossulariaceae 69–84; *Phyllonoma* 69–84
Guatemala: *Arceuthobium* 411–418
Gustavia 400–401, 403–405; *dubia* 399, 404, fig. 405; *superba* 399, 404, fig. 405
Gymnosperm 105, 107
Halictidae 88–89
Halictus 92, 96; *pectoralis* 88
Haloragaceae: *Myriophyllum* 97
Haplopappus 141, 200–201, 209, 219; sect. *Blepharodon* 201; sect. *Euhaplopappus* 201; sect. *Halopappus* 201; sect. *Stenotus* 201
HAWKSWORTH, FRANK G. & DELBERT WIENS, *Arceuthobium* (Viscaceae) in Mexico and Guatemala: Additions and range extensions 411–418
HECKARD, LAWRENCE R. & TSAN-IANG CHUANG, Chromosome numbers, polyploidy, and hybridization in *Castilleja* (Scrophulariaceae) of the Great Basin and Rocky Mountains 159–172
Helenieae 137–138, 147–148, 150
Helenium: *aestivale* 220; *serotinum* 220
Heliantheae 137–140, 143, 147–151
Helianthus 214, 217, 221–223; *annuus* 140; *debilis* 223, subsp. *cucumerifolius* 223, subsp. *debilis* 223, subsp. *silvestris* 223, subsp. *tardiflorus* 223, subsp. *vestitus* 223, var. **silvestris 223**, var. **tardiflorus 223**, var. **vestitus 223**; *decapetalus* 222; *glaucophyllus* 221–223; *laevigatus* 221; *microcephalus* 217, 221–223; *parviflorus* 221, var. *attenuatus* 221; *smithii* 217, 221–223; *smithiorum* 222; *strumosus* 221–222; *vestitus* 223
Helminthostachys 11
Helophilus divisus 88
Hemionitis: *palmata* 394; *pinnatifida* 391, 394
Hemiptera 92
HERVEY, ANNETTE, CLARK T. ROGERSON & INA LEONG, Studies on fungi cultivated by ants 226–236
Heterobathmy 140
Heterotheca 217–219; *adenolepis* 219; *aspera* 219; *graminifolia* 219; *latifolia* 219; *microcephala* 219
Hibiscus 408
Hilara atra 89
Hilaria 207
HILL, ROBERT J., Technical note: Ultraviolet reflectance-absorbance photography; an easy, inexpensive research tool 382–390
Hispaniola: *Eleocharis* 237
HOLMGREN, ARTHUR H. See Cronquist, Holmgren, Holmgren, Reveal & Holmgren 153
HOLMGREN, NOEL H. See Cronquist, Holmgren, Holmgren, Reveal & Holmgren 153
HOLMGREN, PATRICIA K. See Cronquist, Holmgren, Holmgren, Reveal & Holmgren 153
Holopyxidium 400
Homoptera 92
HORIKAWA, YOSHIWO, *Atlas of the Japanese Flora II. An introduction to plant sociology of East Asia*—new book reviewed 115
Hornemannia: *floccosa* 272; *racemosa* 275
Horneophyton 3, 15, 17; *lignieri* fig. 18
Hydrasperma 347–348; *tenuis* 347
Hydrophyllaceae: *Nama* 209; *Phacelia* 211–212
Hyenia 15, 24
Hymenophyllaceae 5–7, 24, 34, 48, 66; *Cephalomanes* 57; *Didymoglossum* 57; *Gonocormus* 7; *Trichomanes* 7, 398
Hymenophylloideae 59
Hymenoptera 92
Hypolepis 391; *bogotensis* 394; *repens* 394; *viscosa* 394
Ibyka 15, 24; *amphikoma* fig. 23
Ilex opaca 373
Illicium (Illiciaceae) 97
Index (author) of *Flora North America Reports* 430–432
Instructions to contributors 134–136
Inuleae 140, 149
Iris (Iridaceae) 46
IRWIN, HOWARD S. & RUPERT C. BARNEBY, Monographic studies in *Cassia* (Leguminosae: Caesalpinioideae). VI. Supplementary notes on section *Apoucouita* Bentham 277–290
Isoetaceae 56
Isoetales 56
Ixoroideae 145–146
Jeffrey pine 378
JONES, E. B. GARETH, editor, *Recent advances in aquatic mycology*—new book reviewed 381
Jugastrum 400
Juncaceae 67
Juniper 208
KALLUNKI, JACQUELYN A. See Kowal, Mori & Kallunki 399–410
———. See Mori & Kallunki 69–84
KAPLAN, DONALD R., Morphological status of the shoot systems of Psilotaceae 30–53
Kaulangiophyton 15, 19
Keys: *Arceuthobium globosum* 411–413; *Cassia* sect. *Apoucouita* 278–279, *adiantifolia* vars. 280, *eitenorum* vars. 286, *ensiformis* vars. 287, *negrensis* vars. 283; *Chrysopsis graminifolia* vars. 220; *Dichapetalum* 158; *Disterigma*, Central America 258; *Helianthus* 221; *Lateropora* 260; *Lysiclesia* 263; *Macleania* 265; *Oreanthes* 173; *Perama* 193–194; *Phyllonoma* 75–76; *Themistoclesia*, Central America 266; *Vaccinium*, Costa Rica and Panama 270; *Xylorhiza* 203
KING, ROBERT C., *Handbook of genetics, volume 5. Molecular genetics*—new book reviewed 99
KIRKBRIDE, JOSEPH H., JR. See Steyermark & Kirkbride 191–198
KONDO, KATSUHIKO. See Casper & Kondo 112–115
KOWAL, ROBERT R., SCOTT A. MORI & JACQUELYN A. KALLUNKI, Chromosome numbers of Panamanian Lecythidaceae and their use in subfamilial classification 399–410

KOYAMA, TETSUO, A new species of *Eleocharis* (Cyperaceae) from the West Indies 237–239
Kryshtofovichia africani 19
Lactuceae 137, 148–151
Lagenospermum 338, 340, 347–349; *imparirameum* 332, 334–340, figs. 335 & 337, figs. 344 & 345, 347–348; *nitidulum* 338; *sinclairi* 338–339
Lagenostoma 338
Lagerstroemia 408
Lamiaceae 428
LARONE, DAVISE HONIG, *Medically important fungi, a guide to identification*—new book reviewed 99
Lasioglossum nelumbonis 89
Lateropora 255, 260, 269; key to species 260; *ovata* 260; **santafeensis** 255, 260–**261**
LAWYER, JANE I. See Rohr, Lawyer, Morse & Shetler 419–432
Leclercqia 15, 100, 104–106, 108, 110; *complexa* 101
Lecythidaceae 399–410; subfamily Foetidioideae 399–401, 403; subfamily Lecythidoideae 399–404, 406; subfamily Napoleonaeoideae (Napoleonoideae) 399–401, 403–404; subfamily Planchonioideae 399–401, 403–404, 406; *Abdulmajidia* 400; *Allantoma* 400; *Asteranthos* 400–401, 403–404; *Barringtonia* 400–401, 404, 408; *Bertholletia* 400–401; *Careya* 400–401; *Cariniana* 400; *Cercophora* 400; *Chydenanthus* 400; *Chytroma* 400; *Combretodendron* 400–401, 406; *Corythophora* 400; *Couratari* 400, 404; *Couroupita* 399–403, 405, 408; *Crateranthus* 400; *Eschweilera* 399–400, 402, 405, 407; *Foetidia* 400–401, 403–404; *Grias* 399–404, 407; *Gustavia* 399–401, 403–405; *Holopyxidium* 400; *Jugastrum* 400; *Lecythis* 399–400, 403, 407–408; *Lecythopsis* 400; *Napoleonaea* 400–401, 404; *Neohuberia* 400; *Pachylecythis* 400; *Petersianthus* 400–401, 404, 406; *Planchonia* 400–401; *Sapucaya* 400; *Strailia* 400
Lecythidales 406
Lecythidoideae 399–404, 406
Lecythis 400, 407; *minor* 399, 403, fig. 407, 408; *tuyrana* 399, 403
Lecythopsis 400
Leguminosae: 46, 277–290; Caesalpinioideae 277–290; *Cassia* 277–290
Lentibulariaceae: 112–115; *Pinguicula* 112–115
LEONG, INA. See Hervey, Rogerson & Leong 226–236
Lepidospartum 148
Lepiota 226, 232–235; *excoriata* 232–233; *lutea* 232–233; *molybdites* 232–233; *morgani* 232–233; *naucina* 232–233; *nigrocinerea* 232–233; *procera* 232–233
Lepisorus 396
Lesser Antilles: *Eleocharis* 237–239
Leucoagaricus: *excoriatus* 233; *naucinus* 233
Leucocoprinus 233–235; *gongylophorus* 235; *luteus* 233
LEWIS, WALTER H. & MEMORY P. F. ELVIN-LEWIS, *Medical botany, plants affecting man's health*—new book reviewed 99
Liabeae 137, 148
Liabinae 148
Licania 154–156; sect. *Moquilea* 155; subgenus *Moquilea* 155; **chiriquiensis** **154**–156, fig. 155; *minutiflora* 156
Liliaceae: *Allium* 212
Limnosipanea 196; *parviflora* 195
Lindsaea 391; *arcuata* 394
Lindsaeoideae 59
Liriodendron 373; *tulipifera* fig. 385
Lobeliaceae 146
Loxogramme lanceolata 59
LUTEYN, JAMES L., Notes on Neotropical Vaccinieae (Ericaceae). IV. A review of the genus *Oreanthes* 173–176
———, Notes on Neotropical Vaccinieae (Ericaceae). V. Five new species from South America 177–182
——— & ROBERT L. WILBUR, New genera and species of Ericaceae (Vaccinieae) from Costa Rica and Panama 255–276
Lycophyta 15, 101
Lycophyte 108
Lycopodiaceae 6, 55, 59–60; *Lycopodium* 3, 54, 59, 66
Lycopodiales 56
Lycopodiopsida 54, 62
Lycopodium 59, 66; *nudum* 3, 54; *tannensis* 54
Lycopods 3, 11–12, 16–17, 19, 26, 54, 56
Lygodesmia 214
Lygodiaceae 5
Lygodioideae 59
Lygodium 32; *circinatum* fig. 11
Lysiclesia 255, 261, 263; key to species 263; *caudata* 261, 263; *minor* 263; **panamensis** 255, **261**–263, fig. 262
Lythraceae 408; *Lagerstroemia* 408
Machaeranthera 199–202, 204; sect. *Machaeranthera* 200, 215; sect. *Xylorhiza* 199, 202, 215; series *Fruticosae* 199; series *Integrifoliae* 199; series *Originales* 200–201; series *Variabiles* 201; series *Verae* 201; *blephariphylla* 202; *cognata* 204; *coloradoensis* 215; *frutescens* 203; *glabriuscula* 208, 214, var. *confertifolia* 207, var. *villosa* 214; *kingii* 215; *orcuttii* 206; *tortifolia* 210, var. *imberbis* 211; *venusta* 212; *wrightii* 208
Macleania 256, 263, 265; key to species 265; *glabra* 265; *pentaptera* 270; *rupestris* 265; **talamancensis** 255, **263**–265, fig. 264
Macrolepiota procera 233
Madiinae 148
Magnolia 97, 373
Magnoliaceae: *Liriodendron* 373, 385; *Magnolia* 97, 373
Magnoliales 406
Malpighia 183–184; *armeniaca* 183; *glandulosa* 183; *nitida* 183; *odorata* 183

Malpighiaceae 183–190; *Bunchosia* 183–190; *Byrsonima* 183–184; *Malpighia* 183–184
Malvaceae 408; *Hibiscus* 408; *Sphaeralcea* 211
Malvales 408
Maps: See distribution maps
Marattia weinmanniifolia 391, 394
Marattiaceae 56, 59, 68; *Marattia* 391, 394
Marattiales 14–15, 56, 62, 68
Marsileaceae 34
Marsileales 15
Matoniaceae 5
Mattuschkaea (*Mattuschea, Mattuskea, Mattuschkea*) 191, 193; *hirsuta* 193
Mattuschkia 191, 193
McGregor, R. L. (Coordinator), T. M. Barkley (Editor), & nine collaborators, *Atlas of the Flora of the Great Plains*—new book reviewed 375
Melampodium 308
Melastomataceae: *Mouriri* 285
Meligethes 88–89
Menodora 211
Mesovelia 92
Mesquite, scrub 206
Mexico: *Arceuthobium* 411–418; fern chromosome counts 391–398; *Pinguicula* 112–115
Mickel, John T.—book review of *The fern dictionary*, by Wilbur W. Olson 367
———. See Smith & Mickel 391–398
Microgramma 36, 38; *vacciniifolia* 34, fig. 35
Mikania 57
Milkvetch, Wasatch 310
Mimosaceae: *Acacia* 46, 67, 211
Mississippi River: exchange 87
Mistletoes, dwarf 411–418
Moellerius 228–229
Mohria 10; *caffrorum* fig. 11
Monocotyledons 153
Monographic studies in *Cassia* (Leguminosae: Caesalpinioideae). IV. Supplementary notes on section *Apoucouita* Bentham, by Howard S. Irwin & Rupert C. Barneby 277–290
Monotropa (Monotropaceae) 57
Moore, Lesa A. See Schneider & Moore 88–99
Mori, Scott A. See Kowal, Mori & Kallunki 399–410
——— & Jacquelyn A. Kallunki, A revision of the genus *Phyllonoma* (Grossulariaceae) 69–84
Morphologic and taxonomic relationships of the Psilotaceae relative to evolutionary lines in early land vascular plants, by Patricia G. Gensel 14–29
Morphological status of the shoot systems of Psilotaceae, by Donald R. Kaplan 30–53
Morphological studies of the Nymphaeaceae. VII. The floral biology of *Nuphar lutea* subsp. *macrophylla*, by Edward L. Schneider & Lesa A. Moore 88–99
Morse, Larry E. See Rohr, Lawyer, Morse & Shetler 419–432
Moths 383
Mouriri oligantha 285
Muhlenbeckia platyclados 67
Musci 353–367
Muscidae 88–89
Mutisieae 140, 149–151
Mycerinus 256
Mycetophylax conformis 228, 234
Myriophyllum 97
Myrmicocrypta: *buenzlii* 228, 234; *ednaella* 228
Myrtaceae 399–401, 406
Myrtales 406, 408
Nabalus fraseri var. *barbatus* 223
Nama 209
Napoleonaea (*Napoleona*) 400–401, 404; *leonensis* 401; *vogelii* 401
Napoleonaeaceae (Napoleoneae) 401
Napoleonaeoideae (Napoleonoideae) 399–401, 403–404
Nelumbo 97; *pentapetala* 96–97
Nelumbonaceae 97; *Nelumbo* 96–97
Nematothallus 105–106
Neohuberia 400
Nephrolepis 32; *pectinata* 391, 394
Nerisyrenia 209
New genera and species of Ericaceae (Vaccinieae) from Costa Rica and Panama, by James L. Luteyn & Robert L. Wilbur 255–276
New species of *Eleocharis* (Cyperaceae) from the West Indies, by Tetsuo Koyama 237–239
New species of *Eupatorium* (Compositae) endemic to Grand Bahama Island, by Susan Plettman 85–87
New species of *Pinguicula* from Mexico (Lentibulariaceae), by S. J. Casper & Katsuhiko Kondo 112–115
Niklas, Karl J.—book review of *Fossil algae. Recent results and developments*, edited by Erik Flügel 433
———. —book review of *Structure and classification of Paleocommunities*, edited by Robert W. Scott & Ronald R. West 239–240
———, Theoretical evolutionary rates in plant groups and the fossil record 241–254
——— & P. G. Gensel, Chemotaxonomy of some Paleozoic vascular plants. Part II: Chemical characterization of major plant groups 100–111
Nitidulidae 88
Nitro-toxins 310–331
Noeggerathia 16
Noeggerathiales 16
Noeggerathiophyta 16
Noeggerathiostrobus 16
North America: *Astragalus* 310–326
North America, eastern: *Eleocharis* 129–133
North America, northern: *Tetraplodon* 353–367
Notes on Neotropical Vaccinieae (Ericaceae). IV. A review of the genus *Oreanthes*, by James L. Luteyn 173–176
Notes on Neotropical Vaccinieae (Ericaceae).

V. Five new species from South America, by James L. Luteyn 177–182
Notes on the Asteraceae of the Southeastern United States, by Arthur Cronquist 217–225
Notiphila 88
Nuphar 88–99, fig. 95; floral biology 88–99; *advena* 88–89; *lutea* 88–89, subsp. *macrophylla* 88–90, fig. 91, 92, fig. 93, subsp. *polysepala* 89
Nymphaea 97
Nymphaeaceae 88–99; *Nuphar* 88–99; *Nymphaea* 97; *Victoria* 97
Occurrence of nitro-toxins in North American *Astragalus* (Fabaceae), by M. Coburn Williams & Rupert C. Barneby 310–326
Occurrence of nitro-toxins in Old World and South American *Astragalus* (Fabaceae), by M. Coburn Williams & Rupert C. Barneby 327–331
Ochna (Ochnaceae) 408
Odonata 92
Old World: *Astragalus* 327–331
Oleaceae: *Menodora* 211
Olearia 141
Olson, Wilbur W., The fern dictionary—new book reviewed 367
Onesia floralis 88
Oocampsa 22, 100, 103, 105–106, 108; *cathea* 101
Ophioglossaceae 5–6, 11, 59, 68; *Botrychium* 5, 11, 56, 392; *Helminthostachys* 11; *Ophioglossum* 11, 56
Ophioglossales 14, 56, 62, 68
Ophioglossum 11, 56
Opuntia 57, 211, 214
Orchid 382
Oreanthes 173–176; key to species 173; *buxifolius* 173–174; **ecuadorensis** 173–176, **175**; *glanduliferus* 173–176; **rotundifolius** 173–**176**
Orestovia 105–107
Orthaea: **rusbyi** 177, **181**–182; *secundiflora* 182
Orthiopteris dominguensis 397
Oryzopsis 214
Osmunda 10–11, 33, 42, 56, 58; *cinnamomea* 33; *regalis* fig. 11, 394
Osmundaceae 12, 59; *Osmunda* 10–11, 33, 42, 56, 58, 394; *Todea* 42
Osmundales 15
Pachylecythis 400
Pachypteris 105, 107
Pachytheca 105–106
Paeonia (Paeoniaceae) 97
Paijmans, K., editor, *New Guinea vegetation*—new book reviewed 432
Palaeanthus problematicus 137, 142
Paleozoic plants, vascular: chemical characterization of major plant groups 100–111
Palmae: See Arecaceae
Panama: Ericaceae (Vaccinieae) 255–276; Lecythidaceae 399–410; two new species (*Licania*, *Dichapetalum*) 154–158
Pandanaceae 33; *Pandanus* 349
Pandanus helicopus 349
Papaver (Papaveraceae) 428
Parka 105–106
Pellaea ternifolia 391, 394
Penstemon 214
Perama 191–198; evolutionary trends and subgeneric classification 192–193; history of genus 191–192; key to species 193–194; sect. *Buchia* 192; sect. **Diperama** 191–**192**, 193, 195–196; sect. *Euperama* 192; sect. *Rosella* 192, 194; sect. *Perama* 192; *dichotoma* 192–194; *galioides* 192–193; **harleyi** 191–**194**; *hirsuta* 192–193; *holosericea* 192, 194–197; **irwiniana** 191–193, **195**–196; *mexiae* 192–193; **parviflora** 191–192, 194–**195**, 196; *plantaginea* 192–193; *schultesii* 192–193; **sparsiflora** 191–192, 194–197, **196**; *wurdackii* 192–194
Pereskia 57
Pertica 15, 19–22, 105–106, 108; *quadrifaria* 20–22, fig. 21; *varia* 20–22, fig. 21
Petersianthus 400, 404; *macrocarpus* 401, 404, 406
Phacelia 211–212
Phanerophlebia 391; *juglandifolia* 394; *macrosora* 394; *nobilis* 394; *pumila* 394, 396; *remotispora* 391, 396
Philaenus 92
Phlebodium araneosum 396
Phlox maculata fig. 386
Phoradendron 414
Phryganidae 89
Phyllobotryum spathulatum 73
Phyllonoma 69–84; exsiccatae 84; key to the species 75–76; morphology and anatomy 70–74; taxonomy 74–82; *cacuminis* 69, 76; *coriacea* 80; *integerrima* 76, 78; *laticarpii* 69; *laticuspis* 69–70, 73, fig. 75, 76, 79–82, fig. & map 80, 84; *ruscifolia* 69–70, figs. 71–72, 73–79, figs. 74–75, fig. & map 77, 82, 84; *tenuidens* 70, figs. 71–72, 73, figs. 74–75, 75, fig. & map 78, 78–80, 82, 84; *triflora* 78–79; *weberbaueri* 69–70, 73, fig. 75, 76, fig. & map 77, 82, 84
Phyllonomoideae 69
Pidonia scripta 89
Pinaceae: *Abies* 415; *Pinus* 48, 373, 412–418
Pines (see *Pinus*): Jeffrey 378; pinyon 417
Pinguicula 112–115; sect. *Isoloba* 112, 114; subgenus *Isoloba* 112; subsect. *Agnatiformis* 115; *lilacina* 115; *pumila* 115; **sharpii 112**–115, fig. 113, fig. 114
Pinopsida 56
Pinus 373, 412–418; *arizonica* 412, 416; *ayacahuite* 417; *caribaea* 412, 415; *chiapensis* 417; *contorta* 416; *cooperi* 412–413, 418; *douglasiana* 412; *durangensis* 412, 418; *engelmannii* 412, 418; *hartwegii* 412–414; *herrerai* 416, 418; *lawsonii* 412, 416–418; *michoacana* 412–413, 415, 417–418; *mono-*

phylla 48; *montezumae* 412–413, 415–417; *oaxacana* 412, 415–417; *oocarpa* 412, 415, var. *ochoterenai* 415; *patula* 412, 414–416; *pringlei* 412; *pseudostrobus* 412, 414–415, 417–418; *rudis* 412–414; *teocote* 416, 418
Pinyon 208
Pityopsis 218
Plagiozamites 16
Planchonia 400; *valida* 401
Planchonioideae 399–401, 403–404, 406
Platycerium 7, 57
Pleopeltis 57, 396; *angusta* 391, 394–396, fig. 395; *percussa* 396
PLETTMAN, SUSAN, A new species of *Eupatorium* (Compositae) endemic to Grand Bahama Island 85–87
Pluteus nanus 232–233
Poaceae: *Agropyron* 214; *Aristida* 209; *Erioneuron* 209; *Hilaria* 207; *Oryzopsis* 214
Podocarpaceae 47
Polemoniaceae: *Phlox* fig. 386
Polybotrya cervina 396
Polycardia 69
Polygonaceae: *Eriogonum* 212; *Rheum* 385, 388
Polypodiaceae 56, 59, 396; *Campyloneurum* 391–392; *Grammitis* 57; *Lepisorus* 396; *Loxogramme* 59; *Microgramma* 34–36, 38; *Phlebodium* 396; *Platycerium* 7, 57; *Pleopeltis* 57, 391, 394–396; *Polypodium* 391, 394–396
Polypodiales 54–55
Polypodiopsida 54, 62
Polypodium: *araneosum* 396; *bolivianum* 396; *christensenii* 396; *collinsii* 396; *friedrichsthalianum* 394–396, fig. 395; *longepinnulatum* 396; *pleolepis* 391, 396; *ptilodon* var. *caespitosum* 396; *pyrrholepis* 396; *sanctaerosae* 396; *triseriale* 396
Polystichum: *distans* 396; *erythrosorum* 397; *hartwegii* 397; *muricatum* 397; *platyphyllum* 397
Polytrichaceae 368–375; *Atrichum* 368–375; *Polytrichum* 369, 371, 374
Polytrichum: *angustatum* 371; *controversum* 371; *cylindricum* 369, fig. 369, 371, 374; *undulatum* 371
Potato 116
PRANCE, GHILLEAN T., Two new species for the Flora of Panama 154–158
Prenanthes 217, 223; **barbata 223**
Progymnospermopsida 15, 101
Progymnosperms 16, 20, 22, 26, 108
Protocephalopteris 15
Protohyenia 15
Protolepidodendron 15
Protopteridales 15, 24
Protosalvinia 105–106, 108
Prototaxities 105–106
Psalixochlaena 15, 26; *cylindrica* fig. 25, 25
Psammisia 256
Psathyrotes 148
Pseudosporochnus 15, 24, 100, 104–106, 108, 110; *nodosus* 101
Psilactis 201, 219
Psilophytales 16
Psilophytes 16–17, 54, 58, 62
Psilophyton 15, 19–22, 108; *dapsile* 20–22, fig. 21; *dawsonii* 20–22, fig. 21, 25–26, fig. 25; *forbesii* 20, 105–106; *microspinosum* 20–22, fig. 21; *princeps* 20, 22, 105–106
Psilopsida 1, 3, 54
Psilotaceae 1–68; *Psilotum* 1–14, 16, 19, 24, 26–27, 30–31, 36, 42–48, 54–55, 57, 60, 62, 64, 66, 68; *Tmesipteris* 1–14, 16, 19, 24, 26–27, 30, 36, 39, 42–48, 54, 57, 60–61, 64, 66, 68
Psilotaceae symposium 1–68; discussion 64–68; morphologic and taxonomic relationships relative to evolutionary lines in early land vascular plants 14–29; morphological status of the shoot systems 30–53; systematic implications 54–63; systematic position of *Psilotum* and *Tmesipteris* 3–13; taxonomic and morphological relationships 1–2
Psilotales 3
Psilotopsida 62
Psilotum 1–14, 16, 19, 24, 26–27, 30–31, 36, 42–48, 54–55, 57, 60, 62, 64, 66, 68; analysis of the shoot systems 43–48; anatomy of stems and frond bases 9; fertile pinnae, sori and sporangia 10–11; frond and stem 6–9; gametophyte and embryo 5–6; root and rootlessness 9–10; systematic position 3–13; *complanatum* 6, 10, 43, 54, 60; *flaccidum* 6, 8, 10; *nudum* 3–6, 8, 10–12, fig. 11, 44–46, 54, fig. 57
Pteridaceae 5
Pteridium 5–7, 42, 64
Pteridophyta 422
Pteridophytes 391
Pteridosperm 105, 107
Pteris: *muricella* 397; *orizabae* 397
Pterispermostrobus bifurcatus 339
Pteropsida 15
Punica (Punicaceae) 408
Pyrola (Pyrolaceae) 57
Pyrrbalta nymphaeae 89
Quercus alba 373
Ranunculaceae: *Clematis* 385; *Delphinium* 214
Rellimia 15
Renalia 15, 19, 105–106; *hueberi* fig. 18, 19, 26
Restionaceae 67
Retusotriletes 19
REVEAL, JAMES L. See Cronquist, Holmgren, Holmgren, Reveal & Holmgren 153
Review of the genus *Perama* (Rubiaceae), by Julian A. Steyermark & Joseph H. Kirkbride, Jr. 191–198
Revision of the genus *Phyllonoma* (Grossulariaceae), by Scott A. Mori & Jacquelyn A. Kallunki 69–84
Rhacophytaceae 22
Rhacophyton 15, 22, 24; *ceratangium* fig. 23

Rhacopteris: *fertilis* 348; *lindsaeformis* 348; *paniculifera* 348
Rheum rhabarbarum fig. 385, 388
Rhodea 342, 347–348
Rhododendron conference 418
Rhopalosiphum nymphaeae 92
Rhubarb 388
Rhymokalon 15, 24
Rhynia 3, 15–17, fig. 18, 100–101, 103, 105–106; *gwynne-vaughani* 16
Rhyniales 3–4, 6
Rhynie Chert 16
Rhynie Chert plants 3
Rhyniophytes 1, 17–19, fig. 18, 26–27, 65–66, 100, 108
Rhyniophytina 15, 101
Rocky Mountains: *Castilleja* 159–172
ROGERSON, CLARK T.—book review of *Recent advances in aquatic mycology*, edited by E. B. Gareth Jones 381
———. See Hervey, Rogerson & Leong 226–236
ROHR, BECKY R., JANE I. LAWYER, LARRY E. MORSE & STANWYN G. SHETLER, The *Flora North America Reports*—A bibliography and index 419–432
Rosaceae: *Coleogyne* 211
Rosidae 146
Rozites 235; *gongylophora* 235
Rubiaceae 137, 142, 144–147, 191–198; subfamily Ixoroideae 145–146; tribe *Perameae* 191; tribe *Spermacoceae* 191; *Limnosipanea* 195–196; *Mattuschkaea* 191, 193; *Perama* 191–198
Rubiales 144, 147
Rudbeckia 388; *hirta* fig. 387, 388
Saaropteris 16
Saccoloma 397; *dominguensis* 397; *inaequale* 397
Sagebrush 206, 208, 211, 214
Sagittaria 97
Salpingostoma 347; *dasu* 347
Saltbush 209, 212, 214
Salvinia (Salviniaceae) 32
Salviniales 15
Santo Domingo: *Eleocharis* 237–239
Sapucaya 400
Sarcostemma 426
Saururaceae 191, 193: *Mattuschkia* 191, 193; *Saururus* 191
Saururus 191
Sawdonia 15, 17, 105–106; *acanthotheca* 17, fig. 18
Saxifragaceae 69, 73
Scatophaga 89
Schizaea 12, 59, 66; *dichotoma* 8; *fistulosa* fig. 11; *melanesica* 4
Schizaeaceae 5, 15, 59; *Actinostachys* 4–7, 10–12, 24, 66; *Anemia* 392; *Lygodium* 11, 32; *Mohria* 10–11; *Schizaea* 4, 8, 11–12, 59, 66
Schizaeoideae 59
SCHNEIDER, EDWARD L. & LESA A. MOORE, Morphological studies of the Nymphaeaceae. VII. The floral biology of *Nuphar lutea* subsp. *macrophylla* 88–99
SCHUYLER, ALFRED E., Chromosome observations on some eastern North American *Eleocharis* (Cyperaceae) 129–133
SCOTT, ROBERT W. & RONALD R. WEST, editors, *Structure and classification of Paleocommunities*—new book reviewed 239–240
Scrophulariaceae: 159–172, 428; subfamily Rhinanthoideae 159; *Castilleja* 159–172, 212; *Digitalis* 387; *Penstemon* 214
Sedge 129
Selaginella 3, 26, 33, 45, 56, 68
Selaginellaceae 56, 60; *Selaginella* 3, 26, 33, 45, 56, 68
Semiramisia 256; *speciosa* 256
Senecio 138–139, 212; dendro- 141; *praecox* 141
Senecioneae 137, 148–149
Sericomyrmex urichi 228, 232, 236
Shadscale 211–212
SHETLER, STANWYN G. See Rohr, Lawyer, Morse & Shetler 419–432
Silphium 217, 223; *connatum* 223; *perfoliatum* 223, subsp. *connatum* 223, var. **connatum 223**
SKOG, JUDITH E. See Gensel & Skog 332–351
SMITH, ALAN R. & JOHN T. MICKEL, Chromosome counts for Mexican ferns 391–398
SMITH, GARY L., *Atrichum cylindricum* (Polytrichaceae), an overlooked moss in the southeastern United States 368–375
Solanaceae 116–128; *Chamaesaracha* 209; *Solanum* sect. *Basarthrum* 116–128
Solanum 116–128; sect. *Basarthrum* 116–128, crossing studies 121–125, distribution 118–119, morphology 119–121, systematics 125–127; sect. *Petota* 116, 125, 127; series *Appendiculata* 116; series *Articulata* 116; series *Canensa* 117, 120; series *Caripensia* 116–117, 119, 126; series *Muricata* 116; series *Suaveolentia* 117, 119–120; *acaule* 127; *appendiculatum* 116; *basendopogon* 116–121, map 118, 124–127, f. *obtusum* 116, 119, 126; *brevidens* 125; *brevifolium* 116; *canense* 116–127, map 118, fig. 121; *carchiense* 116; *caripense* 116–117, 119–120, 122–127, var. *stellatum* 116; *chimborazense* 116; *connatum* 116; *filiforme* 116–117; *fraxinifolium* 117, 120, 122, 124, 126, var. *protoxanthum* 117; *heiseri* 116, 119, 124; *inscendens* 116; *muricatum* 116, 124–125, f. *glaberrimum* 116, var. *protogenum* 116; *sanctae-marthae* 116–121, map 118, 124–125; *skutchii* 116; *sodiroi* 116, var. *dimorphophyllum* 116; *suaveolens* 116–118, map 118, 120–127, fig. 121, var. *pliophyllidium* 120; *subvelutinum* 116; *tabanoense* 116, 119, 124, 127; *tacanense* 116; *taeniotrichum* 117, 120; *tetrapetalum* 116; *trachycarpum* 116, 119, 121–122, 124–127
Solenites 105–107
Solidago 140, 217, 223–224; *arguta* 224, var.

harrisii 224; *boottii* 224; *chapmanii* 223–224; *harrisii* 224; *odora* 223–224, var. **chapmanii 224**, var. *odora* 224; *rugosa* 224; *sempervirens* 224
South America: *Astragalus* 327–331; Vaccinieae 177–182
Spermolithus devonicus 348
Sphaeralcea 211
Sphagnum lenense 363
Sphenophylls 16
Sphyrospermum 268
Splachnaceae 353–367; *Splachnum* 353–355, 359–360; *Tetraplodon* 353–367; *Voitia* 355–357
Splachnum 359; *adamsianum* 353, fig. 355, 359–360; *mnioides* 360; *paradoxum* 353–355, fig. 355, 359–360
Spongiophyton 105–106
Stamnostoma 340, 348; *huttonense* 340, 348
Staphylococcus aureus 226, 231
STEERE, WILLIAM CAMPBELL, *Tetraplodon paradoxus* and *T. pallidus* (Musci: Splachnaceae) in northern North America 353–367
Stephanomeria 207, 211
STEYERMARK, JULIAN A. & JOSEPH H. KIRKBRIDE, JR., Review of the genus *Perama* (Rubiaceae) 191–198
Stokesia 151
STOUTAMIRE, WARREN, Chromosome races of *Gaillardia pulchella* (Asteraceae) 297–309
Strailia 400
Stromatopteridaceae 5, 9, 30, 36, 48–49, 59
Stromatopteris 4–7, 9–12, 16, 24, 30–32, 36–44, 46, 48, fig. 57, 57–61, fig. 61, 64, 66–67; morphology of the shoot system 36–43; *moniliformis* fig. 11, 30, 36, fig. 37, 55
Studies on fungi cultivated by ants, by Annette Hervey, Clark T. Rogerson & Ina Leong 226–236
Study of morphological variability in *Chenopodium incanum* (Chenopodiaceae) and the recognition of two new varieties, by Daniel J. Crawford 291–296
Stylidiaceae 146
Sunflower, common 140
Symphysia 275–276; *floccosa* 255, 272, 276; *racemosa* 255, 272, 275–276
Syrphidae 88–89
Systematic implications of the Psilotaceae, by W. H. Wagner, Jr. 54–63
Systematic position of *Psilotum* and *Tmesipteris*, the, by David W. Bierhorst 3–13
Taeniocrada 105–106
Tagetinae 137, 147
Tapeworm, vegetable 66–67
Tapura peruviana 73
Taxodiaceae 60
Taxonomic and morphological relationships of the Psilotaceae: Introduction to the symposium, by Richard A. White 1–2
Taxonomy of *Xylorhiza* (Asteraceae—Astereae), the, by Thomas J. Watson, Jr. 199–216
Technical note: Ultraviolet reflectance-absorbance photography; an easy, inexpensive research tool, by Robert J. Hill 382–390
Tectaria: *incisa* 397; *mexicana* 397
Tetraplodon 353–367; *bryoides* var. *paradoxus* 358; *mnioides* 353, 355–360, 363–365, map 365, var. *pallidus* 358, var. *paradoxus* 358, 360–361, 363; *pallidus* 353, 355–361, fig. 355, fig. 357, 363–365, map 365; *paradoxus* 353–363, fig. 357, map 362
Tetraplodon paradoxus and *T. pallidus* (Musci: Splachnaceae) in northern North America, by William Campbell Steere 353–367
Tetraxylopteris 15, 22, 100, 104–106; *schmidtii* 101
Theaceae 403
Theales 406, 408
Thelypteris: subgenus *Amauropelta* 398; *atrovirens* 397; *blanda* 398; *cinerea* 397; *concinna* 397; *ghiesbreghtii* 398; *imbricata* 398; *lanosa* 397; *linkiana* 397; *melanochlaena* 397; *meniscioides* 398; *nubigena* 397; *oligocarpa* 397; *ovata* var. *lindheimeri* 398; *patens* var. *patens* 398; *pilosula* 397; *poiteana* 398; *puberula* 398; *rudis* 397; *scalaris* 397; *tetragona* 398; *tuerckheimii* 398
Themistoclesia 255, 265, 268; key to Central American species 266; *anfracta* 266; *compta* 266; **costaricensis** 255, **265**–267; *cuatrecasasii* 266–267; **flexuosa 177**, fig. 178, 182; **horquetensis** 255, **266**–267; *pentandra* 266, 268; *recondita* 177; *smithiana* 266
Theoretical evolutionary rates in plant groups and the fossil record, by Karl J. Niklas 241–254
Thibaudia: **croatii** 177, **180**–181; *melliflora* 180–181
Tingia 16
Tingiales 16
Tingiostachya 16
Tmesipteris 1–14, 16, 19, 24, 26–27, 30, 36, 42–48, 54, 57, 60–61, 64, 66; analysis of the shoot systems 43–48; anatomy of stems and frond bases 9; fertile pinnae, sori and sporangia 10–11; frond and stem 6–9; gametophyte and embryo 5–6; root and rootlessness 9–10; systematic position 3–13; *elongata* 68; *lanceolata* 6, 8, 45, 60, 68; *tannensis* fig. 39, 54; *vieillardii* 6, 8, 45
Todea 42
Townsendia wrightii 208
Tracheophyta 54
Trachymyrmex 228, 236; *cornetzi* 228, 236; *relictus* 228, 236; *septentrionales* 227–229, 232, 235; *urichi* 228, 232
Tragopogon 214
Trichomanes 7; *radicans* 398
Trichoptera 89
Trilebes 73
Trimerophytaceae 12
Trimerophytes 17, 19–22, 24–27, 66, 100–101
Trimerophytina 15

Trimerophyton 15, 19, 21–22; *robustius* fig. 21, 22
Triphyllopteris 347
Tristichia 348
Turneraceae 71
Two early Mississippian seeds from the Price Formation of southwestern Virginia, by Patricia G. Gensel & Judith E. Skog 332–351
Two new species for the Flora of Panama, by Ghillean T. Prance 154–158
Umbelliferae 69
United States, southeastern: Asteraceae 217–225; *Atrichum* 368–375
Ursinia 148, 150–151
Utleya 255, **267**, 270; **costaricensis** 255, **267**–270, fig. 269
Vaccinieae 173–182, 255–276; five new species from South America 177–182; new genera and species from Costa Rica and Panama 255–276; *Oreanthes* 173–176
Vaccinium 255, 269–270, 274–276; key to Costa Rican and Panamanian species 270; sect. *Oreades* 276; subgenus *Scytanthemum* 276; *consanguineum* 270; **costaricense** 255, **270**–272, fig. 271, 274; *dissimile* 270; **floccosum** 255, 269–270, **272**, 274; *imrayi* 276; **jefense** 255, 269–270, **272**–275, fig. 273; **orosiense** 255, 270, 272, 274–**275**; *poasanum* 270, 272, 274, 276; **racemosum** 255, 274–**275**, 276
Valerianaceae 146
Variation and evolution of selected species of *Solanum* section *Basarthrum* (Solanaceae). II., the, by Gregory J. Anderson 116–128
Verbenaceae 191
Vernonieae 138–140, 148–151
Victoria 97
Viguiera 141, 143; *cronquistii* 143
Virginia, southwestern: Mississippian seeds from Price Formation 332–351
Viscaceae 411–418; *Arceuthobium* 411–418; *Phoradendron* 414; *Viscum* 414
Viscum 414
Vittaria graminifolia 398
Voitia 356; *hyperborea* 355–356, fig. 357
WAGNER, W. H., JR., Systematic implications of the Psilotaceae 54–63
Wasatch milkvetch 310
WATSON, THOMAS J., JR., The taxonomy of *Xylorhiza* (Asteraceae—Astereae) 199–216
WEBER, WILLIAM A., *Rocky Mountain Flora*, ed. 5—new book reviewed 331
West Indies: *Eleocharis* 237–239
WEST, RONALD R. See Scott & West 239–240
WHITE, RICHARD A., Taxonomic and morphological relationships of the Psilotaceae: Introduction to the symposium 1–2
WHITTIER, HENRY O., *Mosses of the Society Islands*—new book reviewed 99
WIENS, DELBERT. See Hawksworth & Wiens 411–418
WILBUR, ROBERT L. See Luteyn & Wilbur 255–276
WILLIAMS, M. COBURN & RUPERT C. BARNEBY, The occurrence of nitro-toxins in North American *Astragalus* (Fabaceae) 310–326
——— & ———, The occurrence of nitro-toxins in Old World and South American *Astragalus* (Fabaceae) 327–331
Witches' broom 412–413, 415
Wyethia 141
Xylorhiza 199–216, map 205; ecological considerations 200; generic relationships 200–202; key to species 203; key to vars. of *X. glabriuscula* 213; key to vars. of *X. tortifolia* 210; taxonomic history 199–200; taxonomy 202–215; sect. **Californica** 200, **203**, 210; sect. *Xylorhiza* 200, 207, 210; *brandegei* 215; **cognata** 203–**204**, 205–207; *coloradoensis* 215; **confertifolia** 203, 205, **207**–208; *frutescens* 203–205; *glabriuscula* 199–203, 208, 212–214, var. *glabriuscula* 205, 213–214, var. **linearifolia** 205, 213, **215**, var. *villosa* 214; *lanceolata* 211; *orcuttii* 203, 205–207; *scopulorum* 211; *standleyi* 204; *tortifolia* 201, 203–204, 206, 209–210, var. **imberbis** 205, 210–**211**, 212, 215, var. *tortifolia* 205, 210–211; *venusta* 200, 203, 205, 212–214; *villosa* 199, 214; *wrightii* 203, 205, 208–209
Yucca 209
Zingiberaceae 61
Zinniinae 148
Zosterophyllophytes 100, 108
Zosterophyllophytina 15, 101
Zosterophylls 17–19, fig. 18, 26–27, 66
Zosterophyllum 15, 17, fig. 18, 100, 105–106; *myretonianum* 26
Zygopteridaceae 22, 24

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION, submitted in accordance with the Act of August 12, 1970: Section 3685. Title 39. United States Code. Brittonia is a quarterly publication, wholly owned by and published by the New York Botanical Garden, Bronx, NY 10458. There are no bondholders, mortgagees, or other security holders. EDITOR and MANAGING EDITOR: Dr. Noel H. Holmgren, New York Botanical Garden, Bronx, NY 10458. Extent and nature of circulation: 1200 copies printed, 916 copies sold by mail subscriptions, 916 total paid circulation, 5 copies distributed free, 921 total distribution, and 279 copies left over for office use, back-issue sales or spoiled after printing. Date of this filing, September 29, 1977. I certify that the statements made by me above are correct and complete. Signed: Anita Weissman, Assistant Manager of Publications, New York Botanical Garden, NY 10458.

BRITTONIA for October–December 1977 (29: 353–448) was issued on 8 December 1977